

The order of operations and A/\bar{A} /agreement interactions

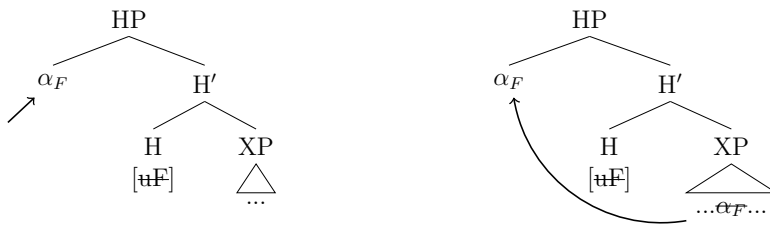
Elise Newman*

University of Edinburgh, elise.newman@ed.ac.uk

October 29, 2021

1 The unity of Merge and Move

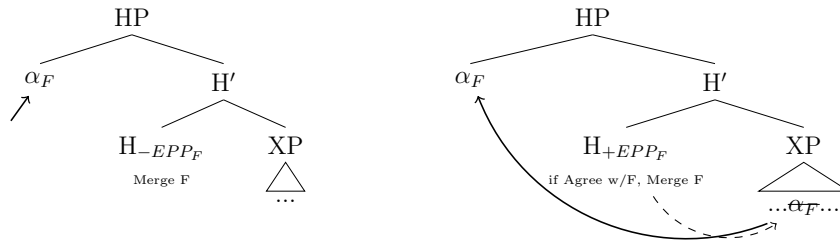
- Some suggestions from Chomsky (1995):
 - (1) Merge is feature driven – structure is built in response to a need to check and delete uninterpretable features
 - (2) There is no operation *Move* – there are only Merge and re-Merge (or external and internal Merge)
- Taken together, these two ideas would suggest that there is no formal distinction between features that trigger external vs. internal Merge Adger (2003); Müller (2010)
- (3) Move and Merge both check the same features



- However, not every theory of movement takes this approach! EPP theory of movement:
 - Merge: induced by a feature of the form *Merge X*
 - Move: induced by a feature of the form *if Agree with X, then Merge X*

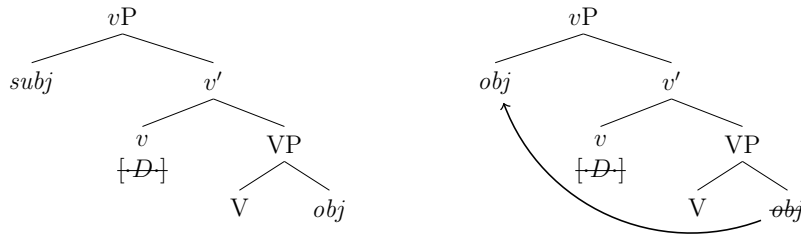
*I owe a great many thanks to Jessica Coon, Patrick Elliott, Sabine Iatridou, David Pesetsky, Norvin Richards, and the audiences at MIT Syntax Square and LingLunch for their wisdom and support throughout this project. I owe a special thanks to Kenyon Branen for a particularly inspiring conversation that led me to start working on Mayan Agent Focus in the first place. All mistakes are my own.

(4) Move is triggered by EPP features, while Merge is not



- Longenbaugh (2019) argues against the EPP: if Merge and Agree can act separately on a head, the unity of Merge and Move is recoverable
 - **Result:** any head that licenses movement could also license external Merge, provided that the result is interpretable/pronounceable
- Transitivity alternations come for free (Longenbaugh, 2019): a single *Merge DP* feature on *v*, henceforth [*D*·], licenses subjects of transitive clauses and raised subjects of intransitive clauses (based on the assumption that A-movement also stops in Spec *v*P, following Legate (2003); Sauerland (2003))

(5) *v* doesn't need distinct features for transitive/unergative vs. passive/unaccusative clauses: just an ever present [*D*·] feature



• **Goals for today:**

- Explore the consequences of this picture of Merge for wh-movement as well as A-movement
- Explore what kinds of derivations are possible, given different orders in which various Merge and Agree features are satisfied
- Show that the predicted possibilities do some work to explain movement/agreement interactions in Romance (Longenbaugh, 2019), as well as wh-movement/Voice interactions in a variety of languages

• Three empirical domains that illustrate some feature interactions:

- Romance past participle agreement: A-movement and agreement are obligatorily correlated for objects

(6) Standard Italian

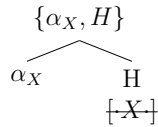
- a. Ho mangiat-o/*a la mela
 have.1.SG eaten-M.SG/*F.SG the apple.F.SG
 “I have eaten the apple.” (D’Alessandro & Roberts 2008)
- b. **Due ladri** sono entrat-i/*o dalla finestra
 two robbers are entered-M.PL/*M.SG from-the window
 “Two robbers entered from the window.” (Belletti 2006: ex.34c)
- c. **Alcuni sindaci** sono stati arrestat-i/*o
 some.M.PL mayors.M.PL are.PL been.M.PL arrested.M.PL/*SG
 “Some mayors were arrested.”
- Subject wh-movement in certain Mayan languages: \bar{A} -movement bleeds subject agreement in most contexts
- (7) **Mayan Agent Focus:** subject (but not object) wh-movement appears to require a special Voice that bleeds subject agreement
- a. Max-ach y-il-a’.
 ASP-B2S A3S-see-TV
 “She saw you.” (Q’anjob’al; Coon et al. (2014), p.10)
- b. Maktxel max- \emptyset y-il naq winaq?
 who PFV-B3S A3S-see CLF man
 “Who did the man see?” (Q’anjob’al; Coon et al. (2014), p.192)
- c. Maktxel max-ach il-on-i?
 who PFV-B2S see-AF-ITV
 “Who saw you?” (Q’anjob’al; Coon et al. (2014), p.213)
- The double object movement asymmetry: \bar{A} -movement entails A-movement for indirect objects but not direct objects in passive double object structures
- (8) **“Double object movement asymmetry”** (DOMA) (Holmberg et al., 2019): a direct object can wh-move from any kind of passive, but an indirect object can only wh-move from an indirect object passive
- a. Hvilken bok ble gitt Jon?
 which book was given Jon
 ‘Which book was given to John?’ *DO wh-movement from DO passive*
- b. Hvilken bok ble Jon gitt?
 which book was Jon given
 ‘Which book was John given?’ *DO wh-movement from IO passive*
- c. Hvem ble gitt boka?
 who was given the.book
 ‘Who was given the book?’ *IO wh-movement from IO passive*
- d. *Hvem ble boka gitt?
 who was the.book given
 intended: ‘To whom was the book given?’ *IO wh-movement from DO passive*
 (Norwegian; Holmberg et al. (2019), p.680)

1.1 Theoretical background

- Assumption: there are two basic syntactic operations: Merge, Agree

(9) $MERGE(X, Y) = \{X, Y\}$

(10) $[\cdot X \cdot]$ = an instruction to Merge with an element bearing X



(11) AGREE: an Agree feature is an unvalued feature (a probe) that searches its c-command domain for something bearing a value for that feature, and copies the value of that feature back to the probe

- a. There seem^(*s)_{uφ} to have arrived only two guests.

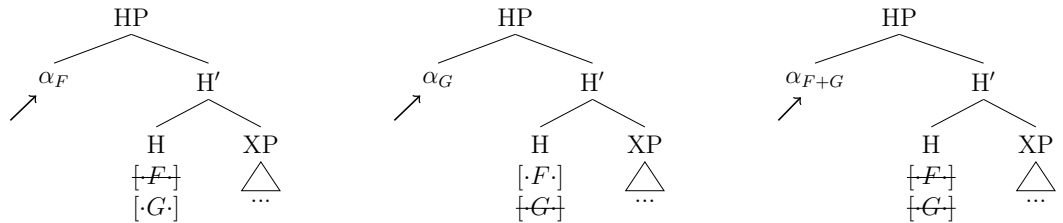
- Proposed properties of Merge features:

(12) Merge features on a head are *unordered* (Longenbaugh 2019, contra e.g. Adger 2003; Müller 2010)

(13) Merge features can *fail* (Preminger, 2014; Longenbaugh, 2019)

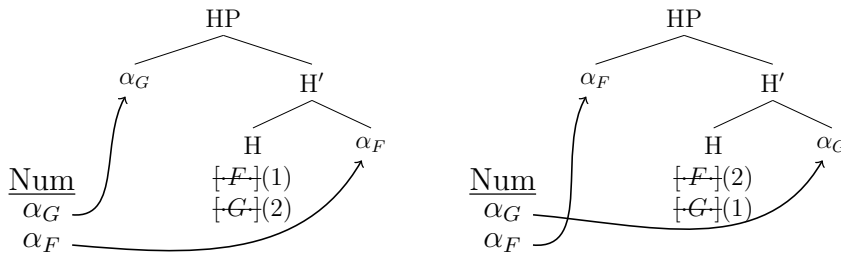
(14) Multiple Merge features can be satisfied at a time

a. *Feature Maximality/Free Rider* condition: Given a head H with features $[F_1] \dots [F_n]$, if XP discharges $[F_i]$, XP must also discharge each $[F_j]$ that it is capable of (Chomsky, 1995; Pesetsky & Torrego, 2001; Rezac, 2013; van Urk & Richards, 2015; Longenbaugh, 2019)

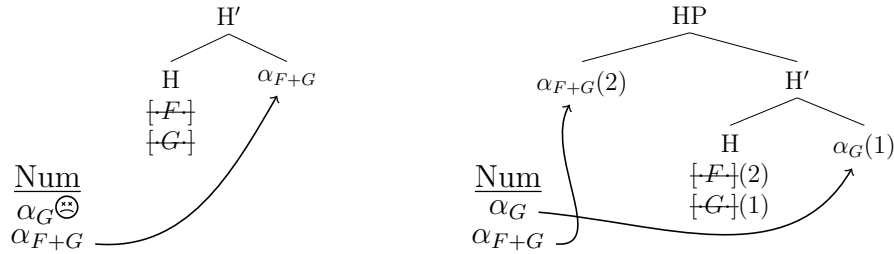


- How might multiple features on a head interact to predict different sorts of derivations?

(15) Both α_G and α_F can merge with H in any order.



- (16) If both α_G and α_{F+G} appear in the clause, α_G must have merged first



- What does this do for us? Lets imagine some heads with multiple features:
 - a head with both $[\cdot D \cdot]$ and $[u\varphi]$ \rightarrow exploring the predictions for such a head yields Romance movement/agreement correlations
 - a head with both $[\cdot D \cdot]$ and $[\cdot wh \cdot]$ \rightarrow exploring the predictions for such a head yields wh-movement/Voice interactions
 - Preview: the head in both scenarios will be v

2 Movement+Agreement in Romance: Longenbaugh 2019

- Romance Past Participle Agreement (PPA):
 - Past participles show object agreement only if there is no transitive subject.

(6) Standard Italian

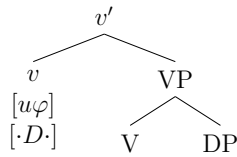
- Ho mangiat-**o**/*a la mela
have.1.SG eaten-M.SG/*F.SG the apple.F.SG
“I have eaten the apple.” (D’Alessandro & Roberts 2008)
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two robbers are entered-M.PL/*M.SG from-the window
“Two robbers entered from the window.” (Belletti 2006: ex.34c)
- Alcuni sindaci** sono stati arrestat-**i**/*o
some.M.PL mayors.M.PL are.PL been.M.PL arrested.M.PL/*SG
“Some mayors were arrested.”

- Hypothesis from Legate (2003); Sauerland (2003): passive/unaccusative objects move through the edge of vP , the canonical subject position
- Hypothesis from Longenbaugh (2019): the features controlling Merge of a subject (transitive or intransitive) and Agree with an object are on the same head: v .

(17) Feature makeup of v :

- Agree: $[u\varphi]$, for controlling PPA
- Merge: $[\cdot D \cdot]$, for introducing the subject

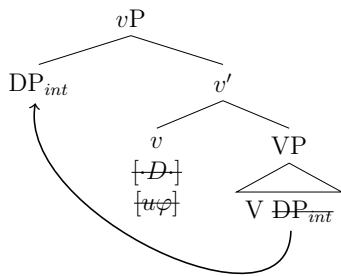
(18) A v' with an internal argument



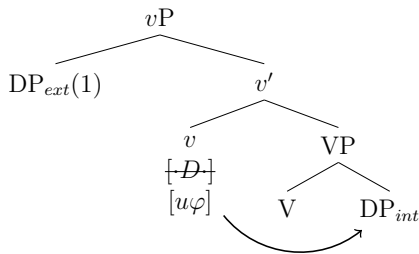
(19) Three potential operations controlled by v

- a. Agree with the object
- b. Merge the internal argument
- c. Merge an external argument

(20) If Agree happens first \rightarrow agreement+A-movement, no transitive subject



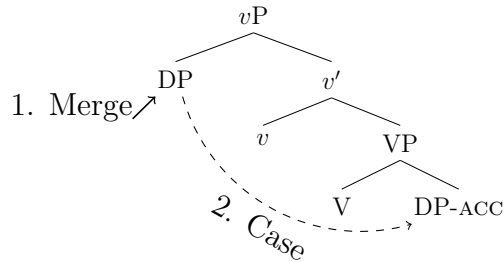
(21) If external Merge happens first \rightarrow Merge and Agree must target separate elements



- So far, this theory predicts that a φ -probe on v should *always* copy the features of the internal argument \rightarrow a bad prediction (there is no PPA in transitive clauses!)
 - Solution: φ -probes can be case discriminating \rightarrow if the object is marked with accusative case, it is inaccessible for agreement.
 - Proposal: accusative case is assigned dependently, to the lower of two DPs in vP
 - Result: whenever there is a transitive subject, the object is inaccessible to Agree.

(22) **Case accessibility:** In the Romance languages with this pattern, only DPs with unmarked case are accessible to φ -Agree (based on Bobaljik 2008; Preminger 2014)

(23) Dependent accusative is assigned when the transitive subject is merged



- **Summary:**

- Feature Maximality ensures that early agreement results in A-movement of objects
- Dependent case assignment+case discrimination prevents objects from controlling agreement in the presence of a transitive subject.

3 Wh-movement/“Voice” interactions

3.1 Subject extraction in Mayan

(7) **Mayan Agent Focus:** subject (but not object) wh-movement appears to require a special Voice that bleeds subject agreement

a. Max-ach y-il-a’.

ASP-B2S A3S-see-TV

“She saw you.”

(Q’anjob’al; Coon et al. (2014), p.10)

b. Maktxel max-∅ y-il naq winaq?

who PFV-B3S A3S-see CLF man

“Who did the man see?”

(Q’anjob’al; Coon et al. (2014), p.192)

c. Maktxel max-ach il-on-i?

who PFV-B2S see-AF-ITV

“Who saw you?”

(Q’anjob’al; Coon et al. (2014), p.213)

(24) Assumption: *v* has two functions

a. to host a DP subject: [*D*·]

b. to host successive cyclic wh-movement (Chomsky, 1986): [*wh*·]

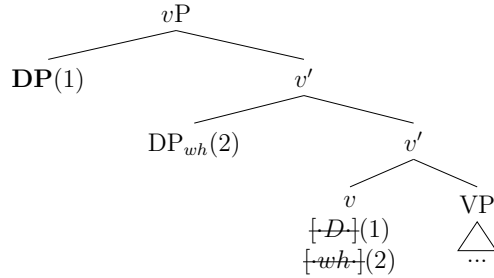
- **Hypothesis:** whatever element satisfies *v*’s [*D*·] feature becomes the surface subject (controls subject agreement, raises to subject position, etc.) whether or not it is the *logical* subject

(25) **Generalized tucking in** (an extension of Richards 1997): Specifiers are projected in the order they are merged

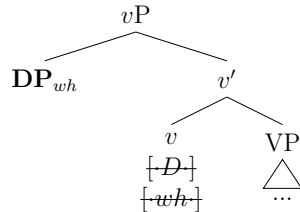
- Suppose we only consider contexts in which a wh-DP is moving (ignoring adjunct wh-movement for now)

- Option 1: each feature on v checked by a different element \rightarrow two specifiers
- Option 2: both features on v checked by one element \rightarrow one specifier
- These options are distinguished by the order of operations

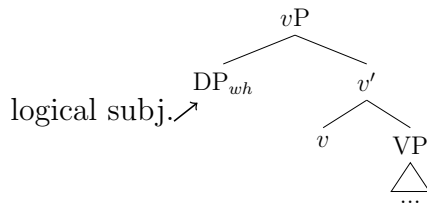
(26) If a non-wh-DP merges before a wh-DP merges $\rightarrow v$ hosts two elements; the non-wh-DP is the surface subject



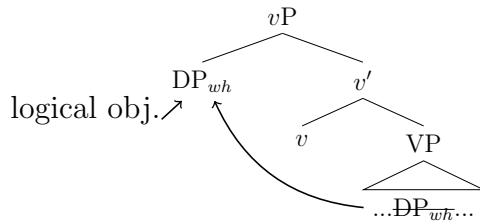
(27) If a wh-DP merges before a non-wh-DP does, it satisfies both features $\rightarrow v$ hosts one element, which is the surface subject



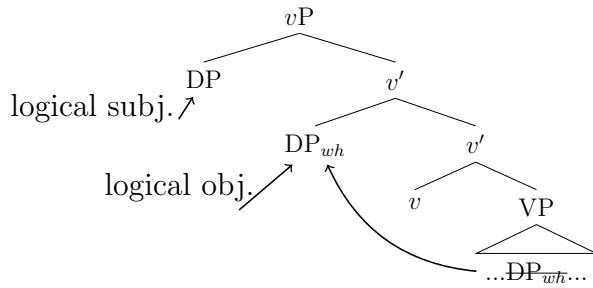
(28) Surface subject = logical subject, e.g. *Who saw the cat?*



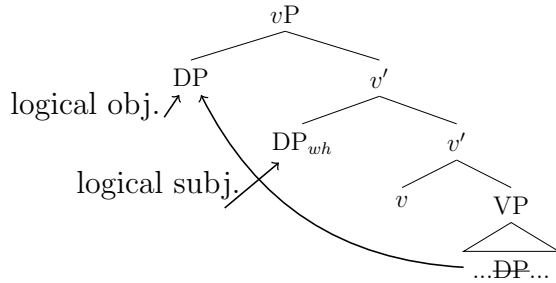
(29) Surface subject \neq logical subject, e.g. *Which lamp fell?*



(30) Surface subject = logical subject, e.g. *What did Sue find?*

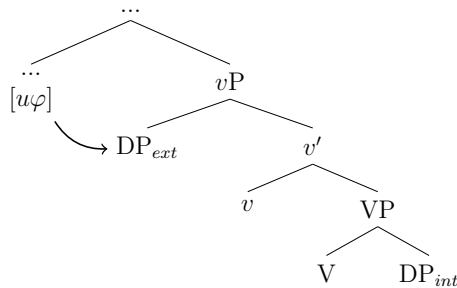


(31) Surface subject \neq logical subject, ??

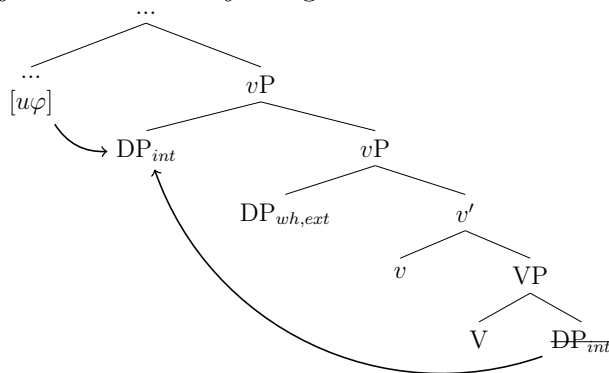


(32) Filling the gap: Q'anjob'al

a. Regular transitive *v*Ps: subject outscopes object \rightarrow subject controls subject agreement



b. Subject wh-questions in certain Mayan languages: object outscopes subject \rightarrow object controls subject agreement



3.2 The Double Object Movement Asymmetry (DOMA)

(8) “**Double object movement asymmetry**” (DOMA) (Holmberg et al., 2019): a direct object can wh-move from any kind of passive, but an indirect object can only wh-move

from an indirect object passive

- a. Hvilken bok ble gitt Jon?
 which book was given Jon

‘Which book was given to John?’

DO wh-movement from DO passive

- b. Hvilken bok ble Jon gitt?
 which book was Jon given

‘Which book was John given?’

DO wh-movement from IO passive

- c. Hvem ble gitt boka?
 who was given the.book

‘Who was given the book?’

IO wh-movement from IO passive

- d. *Hvem ble boka gitt?
 who was the.book given

intended: ‘To whom was the book given?’

IO wh-movement from DO passive

(Norwegian; Holmberg et al. (2019), p.680)

- Before we can understand the DOMA, we need to agree on a structure for double object constructions that predicts the right profile for passives in these languages.
 - Norwegian (and the other languages discussed by Holmberg et al.) are notable for having “symmetric” passives of double object constructions

(33) *English asymmetrical passives*

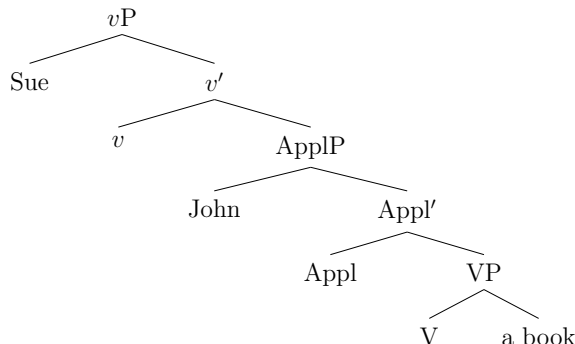
- a. %The book was given John.
 b. John was given the book.

(34) *Norwegian symmetric passives* (Haddican & Holmberg, 2015, ex. 145)

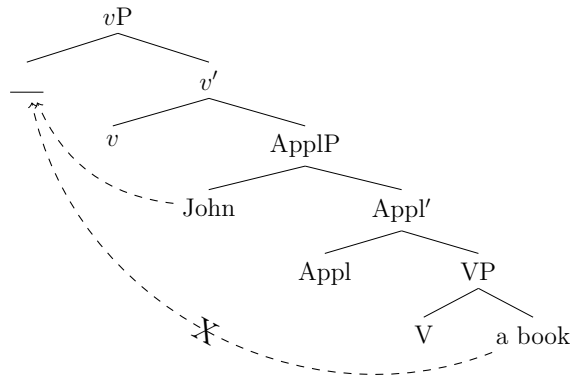
- a. Boka ble gitt Jon.
 the.book was given Jon
 ‘The book was given to Jon.’
 b. Jon ble gitt boka.
 Jon was given the.book
 ‘Jon was given the book.’

- Symmetric passives are puzzling on the often-adopted structure for double object constructions, in which the indirect object c-commands the direct object.

(35) Commonly used structure for *Sue gave John a book*



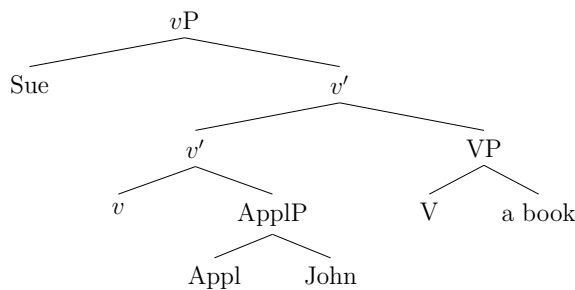
- (36) In a passive, the indirect object should always raise to subject position, failing to predict (34a)



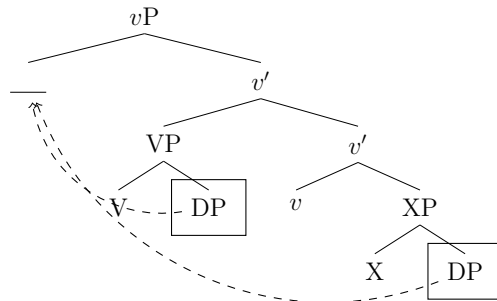
- Solution: a quasi-smuggling structure for double object constructions

- Suppose ApplP doesn't select for VP – v selects for both ApplP and VP, in which case one must be a complement and the other a specifier

- (37) Structure that doesn't run into locality problems: quasi-smuggling structure



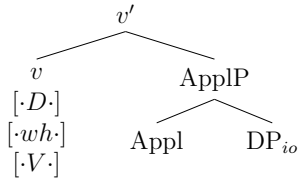
- (38) Neither argument c-commands the other \rightarrow DP complement of V or DP complement of X may raise.



- What happens when we add wh-movement to the mix?

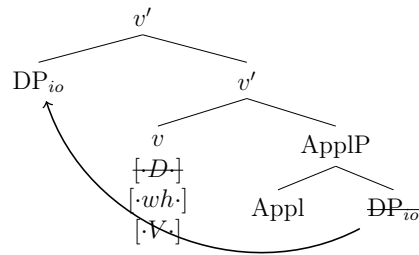
- Starting with wh-moving a direct object in a passive double object construction, let's build the vP step by step

- (39) Step 1: Merge(v , ApplP)

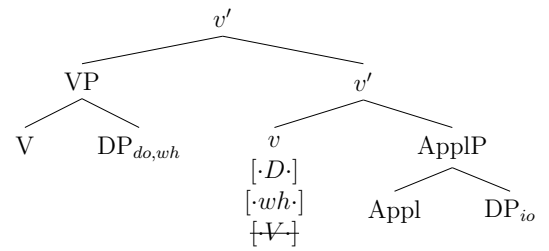


(40) Step 2: two options! Check $[\cdot D \cdot]$ with DP_{io} or check $[\cdot V \cdot]$ with VP

a. Move DP_{io} first



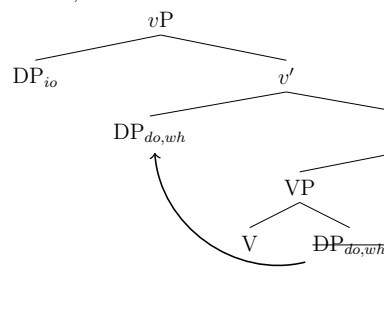
b. Merge VP first



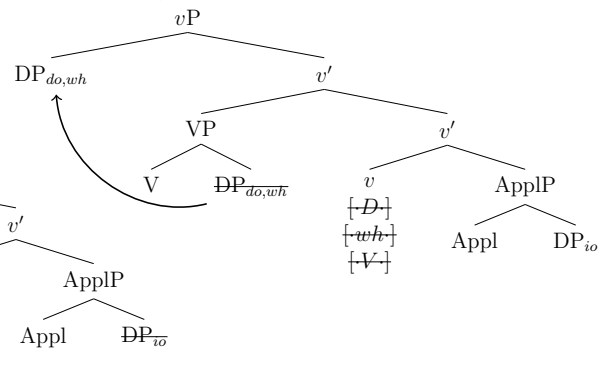
(41) Step 3: check remaining features

a. Merge VP (tucks in), then move

$DP_{do,wh}$



b. Move $DP_{do,wh}$



– Summary:

(42) Checking $[\cdot D \cdot]$ before $[\cdot V \cdot]$ → indirect object passive

a. Hvilken bok ble Jon gitt?
which book was Jon given

‘Which book was John given?’ *DO wh-movement from IO passive*

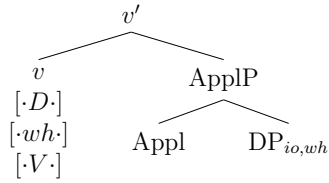
(43) Checking $[\cdot V \cdot]$ before $[\cdot D \cdot]$ → direct object passive

a. Hvilken bok ble gitt Jon?
which book was given Jon

‘Which book was given to John?’ *DO wh-movement from DO passive*

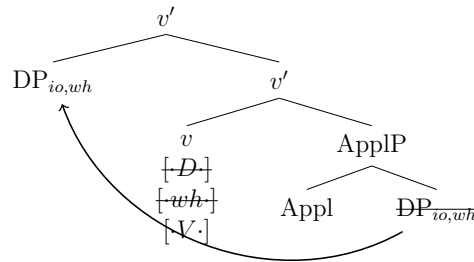
– Let’s repeat the exercise with a wh-moving indirect object: notice that the choice in Step 2 is now different!

(44) Step 1: Merge(v , ApplP)

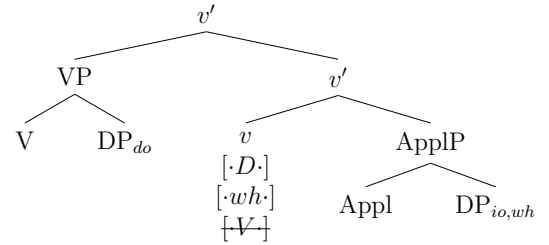


(45) Step 2: check **both** $[\cdot D\cdot]$ and $[\cdot wh\cdot]$ with $DP_{io,wh}$ vs. check **only** $[\cdot V\cdot]$ by merging a VP

a. Move $DP_{io,wh}$ first



b. Merge VP first



– **Proposal:** an economy condition prefers to check more features in one operation if it can, so long as doing so doesn't bleed external Merge altogether

(46) *Multitasking* (revised from van Urk & Richards 2015):

At every step in a derivation, if two operations A and B are possible, and A checks more features than B, the grammar prefers A, *unless* doing B would check a proper subset of the features checked by A.

* **Result:** the indirect object MUST wh-move (and become the passive subject) before the VP containing the direct object is merged → obligatory $\bar{A}+A$ movement

• Summary:

(47) Checking $[\cdot D\cdot]$ and $[\cdot wh\cdot]$ before $[\cdot V\cdot]$ → indirect object passive

a. Hvem ble gitt boka?

who was given the.book

'Who was given the book?'

IO wh-movement from IO passive

(48) Checking $[\cdot V\cdot]$ before $[\cdot D\cdot]$ not an option → no direct object passive

a. *Hvem ble boka gitt?

who was the.book given

intended: 'To whom was the book given?' *IO wh-movement from DO passive*

(Norwegian; Holmberg et al. (2019), p.680)

• Cross-linguistic prediction: joint A/\bar{A} -movement of the indirect object can only be enforced if indirect objects can A-move to subject position in the first place

– → languages without indirect object passives should not exhibit the DOMA

- (49) Greek doesn't have indirect object passives or the DOMA restriction
- a. To vivlio tis charistike tis Marias.
the book.NOM cl.GEN award.NACT the Maria.GEN
'The book was awarded to Mary.' (Anagnostopoulou, 2003, ex. 33)
 - b. *I Maria stalthike to grama.
the Maria.NOM sent.nonact.3s the letter.ACC
intended: 'Mary was sent the letter.' (Anagnostopoulou, 2003, ex. 10a)
 - c. Tinos dhothike to vivlio?
who.GEN gave.NACT.3SG the book.NOM
'Who was the book given to?' (Anagnostopoulou, 2003, ex.308)

– Summary of cross-linguistic predictions:

- * Languages with symmetric passives should show the Norwegian-like restriction: Borne out in Norwegian, North-West British English, Zulu, Lubukusu (Holmberg et al., 2019), Haya (Duranti & Byarushengo, 1977), Sotho (Morolong & Hyman, 1977)
 - * Languages without indirect object passives should not show the Norwegian-like restriction: Borne out in Greek, Tamil (Sundaresan, 2020), German, Turkish, Spanish, Italian
- Takeaway: the complement-specifier distinction makes indirect objects accessible for movement at an earlier stage in the derivation compared to direct objects. Normally, when the indirect object only potentially checks one feature on v , this early advantage doesn't manifest itself as obligatory movement of the IO, because there are other operations that also check one (or more) features on v that might happen first, and bleed indirect object movement. When the indirect object checks more features than any other potential operation, however, we see the earliness effect in action.

4 Conclusion

(50) Crucial Assumptions:

- a. Move (both A and \bar{A}) and Merge are controlled by the same features
- b. The order in which features are checked is in principle unspecified (though occasionally governed by Multitasking where relevant)
- c. v is the head that introduces subjects (represented as $[\cdot D \cdot]$) and is also the locus for successive cyclic wh-movement (represented as $[\cdot wh \cdot]$)

(51) Three empirical domains:

- a. Romance PPA:
 - i. checking $[u\varphi]$ before $[\cdot D \cdot]$ leads to A-movement+Agreement
 - ii. checking $[\cdot D \cdot]$ before $[u\varphi]$ leads to External Merge+no Agreement
- b. Subject extraction:
 - i. checking $[\cdot wh \cdot]$ before $[\cdot D \cdot]$ leads to English-type wh-extraction
 - ii. checking $[\cdot D \cdot]$ before $[\cdot wh \cdot]$ leads to Q'anjob'al-type wh-extraction

- c. The Double Object Movement Asymmetry:
 - i. the complement-specifier distinction makes the indirect object accessible for [*wh*] before [*D*] before the phrase containing the direct object is even merged
 - ii. an economy condition requires a *wh*-indirect object to check both features early in a passive, leading to simultaneous A- and \bar{A} -movement

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